

REMARKS

Claims 1, 13-15, 18, 26, 28-30, 32-37, 39-42, 44-47, 49-60 are pending in this application. Claims 1, 13-15, 18, 26, 28-30, 32-37, 39-42, 44-47, 49-56 have been rejected. Claims 57-60 are newly added herein. Claims 1, 32, 33, 35, 49, 55, and 56 are amended herein.

1. Claims 1, 13-15, 18, 26, 28-30, 32-37, 39-42, 44-47, 49-53, 55 and 56 are rejected under 35 U.S.C. §102(b) as being anticipated by, or in the alternative under 35 U.S.C. §103(a) as being obvious over, Fischer et al. WO 94/13726 (with U.S. Patent No. 6,399,735 being used as the translation).

Independent claims 1, 32 and 35 are amended herein to recite that the water-soluble hotmelt adhesive of the invention is applied to the paper in molten form. Support for this recitation may be found in Applicants' specification, for example, at page 4, lines 15-16 and page 23, lines 19-21.

Fischer et al. discloses hydrophilic polyurethanes which can be used as water-soluble hot melt adhesives. However, Fischer et al. teaches the application of adhesive in the form of an aqueous solution. See, Fischer et al. column 6, lines 14-19. Fischer et al does not disclose or suggest applying adhesive to paper in molten form as presently claimed. Moreover, Fischer et al. is silent with regards to the specific features of Applicant's claimed adhesive and neither discloses nor suggests Applicants' claimed properties such as solubility in water and upper cloud point. Fischer et al. is not sufficient to support a rejection under 35 U.S.C §102(b) or §103(a) .

The Office Action argues that the hot melt of Fischer et al. would inherently have the claimed properties . The Office Action states as follows:

However, it is noted that at least the first example taught by Fischer et al. teaches a polyurethane adhesive comprising the same materials, i.e., polyethylene glycol and TMXDI, as the example taught in applicants specification such that it appears it would intrinsically flow that the polyurethane hot melts taught by Fischer et al. have the claimed values for the specific adhesive properties.

Referring now to Example 1 of Fischer et al. and Applicants' Example 1 at page 25 of the specification, it can be seen that the melt viscosity of the resulting Fischer et al. adhesive was 61 Pa.s (@ 175°C) whereas the melt viscosity of Applicants' hot melt product was 5,500 mPa.s (i.e., 5.5 Pa.s) at 150°C. That is, the melt viscosity of the Fischer et al. product was about 12 times higher than that of Applicants'.

Moreover, in Fischer et al. 1,500 g of polyethylene glycol was reacted with 67.2 g of m-TMXDI, i.e., a polyethylene glycol/TMXDI weight ratio of 22.3. In contrast to this, in Applicants' Example 197.3 parts by weight of polyethylene glycol was reacted with 2.7 parts TMXDI, i.e., a polyethylene glycol/TMXDI weight ratio of 36.0.

These differences illustrate that even though Fischer et al. discloses the use of polyethylene glycol and TMXDI, and other material similar to those used by Applicants, to make a hot melt adhesive, the resulting material is not the same as that of Applicants, and does not intrinsically have the properties as claimed by Applicants. While the Office Action notes that the Patent Office is not equipped to perform process and test products, such experimentation is not necessary to make a determination in this case. On its face, Fischer et al. Example 1 employs different proportions of reactants and provides a different product than that of Applicants' invention. Therefore, the Fischer et al. composition does not inherently disclose or suggest Applicants' invention.

While Fischer et al. disclose the use of their adhesive for bonding paper, such disclosure nowhere suggests the use of the adhesive to bond one layer of paper to another layer of paper for the purpose of making two-ply hygiene paper such as paper towels and toilet paper. Rather Fischer et al. emphasizes use of the adhesive for bonding wallpaper to a wall surface. Fischer is particularly directed to polyurethanes as effective wallpaper adhesives with universal adhesion properties, for placing wallpaper on plastics, such as PVC, or on painted surfaces. The adhesive is applied as an aqueous solution, not in molten form. Fischer further discloses that its adhesive

strength is so high that even heavy wallpapers can be hung without difficulty (see column 6, lines 7-28). Accordingly, nothing in Fischer would lead one skilled in the art to modify the wallpaper adhesives of Fischer to arrive at the presently claimed processes for the production of two-ply papers or, for that matter, to arrive at the presently claimed hygiene paper with any expectation of success.

Regarding claims 33, 49, 55 and 56, Fischer et al. teach the molar ratio of diol to diisocyanate in the vicinity of 1:1. Claims 33, 49, 55 and 56 are amended to recite that the ratio of OH groups in the polyol to the NCO groups in the isocyanate is at least 1.1:1. The term "about" before the ratio is eliminated by this amendment. The ratios disclosed by Fischer et al. are all below 1.1:1 and do not suggest the ratio claimed by Applicants.

The Office Action states that it would have been obvious to one of ordinary skill in the art to experimentally determine/optimize the molar ratio of polyol to isocyanate "within the vicinity of 1:1." However, as stated above, Applicants claimed minimum ratio is not 1:1, but 1.1:1. Nothing in Fischer et al. suggests optimization to the ratios claimed by Applicants.

In lacking any disclosure or suggestion of the claimed processes for the production of at least two-ply paper laminates and the claimed hygiene paper as claimed by Applicants, claims 1, 13-15, 18, 26, 28-30, 37, 39-42, 44-47 and 49-53, 55 and 56 are believed to be nonobvious, and therefore patentable, over Fischer. Accordingly, reconsideration and withdrawal of the rejection of these claims is respectfully requested.

2. Claims 1, 13-15, 18, 26, 28-30, 32-37, 39-42, 44-47 and 49-53, 55 and 56 are rejected under 35 U.S.C. §103(a) as being obvious over the admitted prior art in view of either one of Fischer or Japanese CHEM KK reference JP 54-1347 ("Japanese CHEM KK").

As stated above, claims 1, 32 and 35 are amended to recite that the water soluble hot melt adhesive of Applicants' invention is applied in molten form.

Nowhere does the admitted prior art disclose or suggest a process for the production of at least two-ply paper laminates comprising “applying in molten form a water-soluble hotmelt adhesive having a solubility in water at 20°C of at least 3% by weight to a first layer of paper, the hotmelt adhesive comprising one or more polyurethanes having a molecular weight (M_n) of at least 2,000 and wherein a 0.3% by weight solution of the hotmelt adhesive in water has an upper cloud point of at least 60°C” as presently recited in independent claim 1. Nor does the admitted prior art disclose or suggest a hygiene paper comprising a first layer of paper secured to a second layer of paper by a hotmelt adhesive having a solubility in water at 20°C of at least 3% by weight and comprising one or more polyurethanes having a molecular weight (M_n) of at least 2,000, wherein a 0.3% by weight solution of the hotmelt adhesive in water has an upper cloud point of at least 60°C as presently recited in independent claim 26. Nor does the admitted prior art disclose or suggest a process for the production of at least two-ply paper laminates comprising “applying in molten form a hotmelt adhesive to at least a portion of a first layer of paper, the hotmelt adhesive comprising a polyurethane obtained from a polyurethane reaction mixture containing a hydrophobic diol having a hydrophobic moiety containing from 6 to 36 carbon atoms and contacting a second layer of paper with the hotmelt adhesive” as presently recited in independent claim 32. Nor does the admitted prior art disclose or suggest a process for the production of at least two-ply paper laminates comprising “applying in molten form a hotmelt adhesive to at least a portion of a first layer of paper, the hotmelt adhesive comprising a polyurethane obtained from a polyurethane reaction mixture containing a hydrophobic structural element obtained by reacting at least one NCO-terminated oligomer with a reactant selected from the group consisting of mono-ols and monofunctional amines; and contacting a second layer of paper with the hotmelt adhesive” as presently recited in independent claim 35.

Rather, the admitted prior art discloses that the disadvantage of bonding together hygiene papers using a water-soluble adhesive. The admitted prior art further discloses that while it is

advantageous and desirable for the adhesive to be completely water-soluble, the admitted prior art is silent as to a particular adhesive that is completely water-soluble.

To remedy the deficiencies of the admitted prior art, the Examiner alleges that “[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the water soluble adhesive taught by the admitted prior art any of the well known and conventional adhesives in the art that are completely water soluble such as those suggested by either one of Fischer et al. or Chem KK as only the expected results would be achieved”. This unsupported allegation cannot possibly serve as a basis for this rejection. The admitted prior art in the application simply discloses the disadvantages of water soluble adhesives. Besides, it is well established that there must be some teaching, motivation or suggestion to select and combine references relied upon as evidence of obviousness. *In re Lee*, 277 F.3d 1338, 1342-43, 61 USPQ2d 1430, 1433-34 (CAFC 2002). Accordingly, obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 221 USPQ 929, 933 (Fed. Cir. 1984).

Fischer does not cure the deficiencies of the admitted prior art. Rather, Fischer et al. is directed to polyurethanes as effective wallpaper adhesives with universal adhesion properties, for placing wallpaper on plastics, such as PVC, or on painted surfaces. Fischer et al. neither discloses nor suggests application of the hot melt adhesive in molten form to paper for forming two-ply paper laminates or in forming hygiene papers. In fact, Fischer discloses that the adhesive strength of the adhesive disclosed therein is so high that even heavy wallpapers can be hung without difficulty (see column 6, lines 7-28). As such, nothing in Fischer would lead one skilled in the art to modify the hygiene papers disclosed in the admitted prior art by looking to the wallpaper adhesives of Fischer to arrive at the presently claimed processes for the production of two-ply papers or, for that matter, to arrive at the presently claimed hygiene paper with any expectation of success.

Japanese CHEM KK likewise does not cure the deficiencies of the admitted prior art. Rather, Japanese CHEM KK discloses that a water soluble polyurethane resin can be used in thermally bonding a *hot-melt adhesive cloth to cloth* without hardening the texture of the sewn finished product. The final product is used as, for example, a collar or a cuff in a shirt. Japanese CHEM KK does not disclose or suggest applying hot melt adhesive to paper in molten form. Applicants instead form (1) two-ply paper laminates in the recited processes of the present invention, as set forth in Claims 1, 32 and 35 and (2) hygiene paper, as set forth in Claim 26. Accordingly, one skilled in the art would not look to the disclosure of Japanese CHEM KK for adhesives used in bonding *cloth to cloth* to modify the admitted prior art and arrive at the claimed processes for the production of two-ply paper and the claimed hygiene paper.

With respect to claims 33, 49, 55 and 56, as stated above Fischer et al. teach the molar ratio of diol to diisocyanate in the vicinity of 1:1. Claims 33, 49, 55 and 56 are amended to recite that the ratio of OH groups in the polyol to the NCO groups in the isocyanate is at least 1.1:1. The term "about" before the ratio is eliminated by this amendment. The ratios disclosed by Fischer et al. are all below 1.1:1 and do not suggest the ratio claimed by Applicants. The Office Action states that it would have been obvious to one of ordinary skill in the art to experimentally determine/optimize the molar ratio of polyol to isocyanate "within the vicinity of 1:1." However, as stated above, Applicants claimed minimum ratio is not 1:1, but 1.1:1. Nothing in Fischer et al. or Chem KK suggests optimization to the ratios claimed by Applicants.

For the foregoing reasons, amended Claims 1, 13-15, 18, 26, 28-30, 37, 39-42, 44-47, 49-53, 55 and 56 are believed to nonobvious, and therefore patentable, over the admitted prior art in view of Fischer or Japanese CHEM KK, no matter how these references are considered or combined. Thus, withdrawal of the rejection under 35 U.S.C. §103(a) is respectfully requested.

3. New claims 57 to 60 are added herein. These dependent claims recite a ratio OH groups to NCO groups of at least 1.3:1, and are submitted to be even further distinguishable over

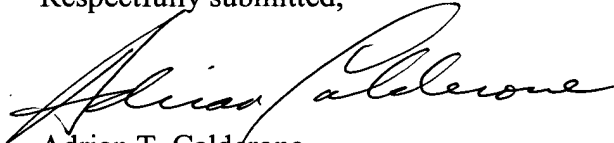
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the art of record. Support for the recitations in these claims may be found in Applicants' specification, for example at page 17, lines 14-17.

CONCLUSION

For at least the reasons stated above, all of the pending claims are submitted to be patentable and in condition for allowance, the same being respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Adrian T. Calderone", written in a cursive style.

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